

Abstract of the Disclosure

A chemical microreactor suitable for generation of hydrogen fuel from liquid sources such as ammonia, methanol, and butane through steam reforming processes when mixed with an appropriate amount of water contains capillary microchannels with integrated resistive heaters to facilitate the occurrence of catalytic steam reforming reactions. One such microreactor employs a packed catalyst capillary microchannel and at least one porous membrane. Another employs a porous membrane with a large surface area or a porous membrane support structure containing a plurality of porous membranes having a large surface area in the aggregate, i.e., greater than about $1 \text{ m}^2/\text{cm}^3$. The packed catalyst capillary microchannels, porous membranes and porous membrane support structures may be formed by a variety of methods.